

Amendment and Response

Applicant: Michael Bauer et al.

Serial No.: 10/789,033

Filed: February 27, 2004

Docket No.: I431.103.101/FIN423US

Title: ELECTRONIC COMPONENT AND SEMICONDUCTOR WAFER, AND METHOD FOR PRODUCING THE SAME

REMARKS

The following remarks are made in response to the Non-Final Office Action mailed November 1, 2007. With this Response, claims 6, 13 and 14 have been amended. Claims 6-14 remain pending in the application and are presented for reconsideration and allowance.

Claim Objections

Claim 14 was objected to because of an informality. Claim 14 has been amended along the lines suggested in the Office Action, thus overcoming the objection.

Claim Rejections under 35 U.S.C. § 112

Claims 13 and 14 were rejected under 35 U.S.C. 112, second paragraph. Claims 13 and 14 have been amended to remove references to “the contact pads,” thus overcoming the rejections.

Claim Rejections under 35 U.S.C. § 103

Claims 6-12 and 14 were rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima JP 2002-299372 in view of Malhi et al. (“Malhi”) U.S. Patent No. 5,031,072. Applicants respectfully traverse these rejections.

It is well accepted that, to establish *prima facie* obviousness, each claim limitation must be considered. MPEP 2143.03. Moreover, there must be motivation to modify a reference. If a proposed modification would render the prior art unsatisfactory for its intended purpose, there is no motivation for the modification. MPEP 2143.01. Applicants respectfully contend that the cited references fail to disclose each claim limitation and further, modifying the references as proposed in the Office Action would result in a non-functioning device. As such, the Office Action fails to establish *prima facie* obviousness.

The Office Action modifies Nakajima by incorporating a circuit substrate as disclosed in Malhi. However, claim 6 includes edge contacts that extend from the top side of the chip towards the rear side opposite the top. Regarding this claim element, the Office Action refers to item 6 in Figure 4 of Nakajima, which is reproduced below.

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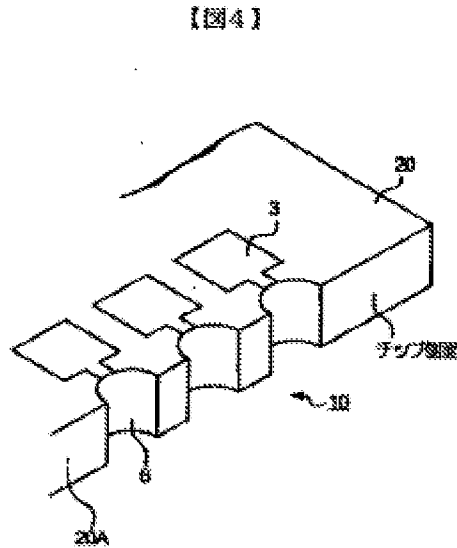
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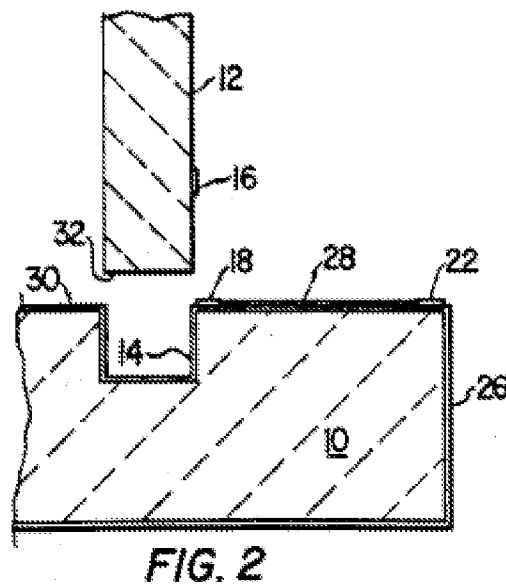
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As noted above, the Office Action proposes modifying the teaching of Nakajima to incorporate a substrate as disclosed in Malhi. In other words, the substrate of Malhi would receive the chips disclosed in Nakajima.

Figure 3 of Malhi, illustrating the substrate, or baseboard 10 is reproduced below.



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The Malhi reference discloses a chip 12 accommodated in a recess 14 in a base board 10 such that the contact area 16 on the top surface is positioned abutting the top surface of the base board 10 and, in particular, adjacent to a contact area 18 on the base board. Malhi specifically teaches the use of a recess in order to arrange the semiconductor chips orthogonally to the top surface of the baseboard. See, e.g., column 1, lines 60 to 62.

Claim 6 recites the semiconductor chips being electrically connected via the edge contacts among one another and also to the external contacts on the circuit substrate. If the semiconductor chip of Nakajima with its edge contacts (item 6 in Figure 4 of Nakajima reproduced above) were substituted for the chip 12 of Malhi shown above as suggested in the Office Action, the edge contact would be situated within the recess 14. The edge contact would thus not be in position to allow an electrical contact to be formed between semiconductor chip and the baseboard 10 by the solder connections, allowing electrical connection of the chip to the external contacts of the substrate.

Furthermore, prior art disclosures that teach away from the claimed device must be considered. MPEP 2143.02. Nakajima appears to teach away from orienting the disclosed chips orthogonally to a substrate. Nakajima teaches the benefits of its disclosed device include resisting shear stress due to material expansion and contraction in a planar direction – accordingly, Nakajima discloses a parallel orientation of the chip relative to the substrate. See e.g., Nakajima at Figure 13. Moreover, Nakajima discloses benefits of using contacts on all four sides of a chip for connection to a substrate. Only contacts on one side of the semiconductor chip would be used for electrical connections with the modification in the Office Action.

Still further, there is no teaching in either Nakajima or Malhi that would indicate to a person of ordinary skill in the art how to orthogonally arrange the chips of Nakajima on a baseboard as taught by Malhi without the use of the recesses 14 and how to electrically connect the edge contacts of Nakajima to the baseboard, and ultimately, the edge contacts.

Therefore, the combination proposed in the Office Action of the semiconductor chips of Nakajima and the base board of Malhi fails to disclose each claim element. Further, such a combination of elements would not lead to a functioning system, thus rendering the prior art

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device unsuitable for its intended use. Accordingly, there is no motivation for the proposed modification of the prior art.

Thus, the Office Action fails to establish prima facie obviousness. As such, Applicants respectfully submit claim 6, and the remaining claims dependent thereon, are proper for allowance.

Claim 13 was rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima in view of Malhi as applied to claim 6 and 12 and in further in view of Koike et al. (“Koike”) WO 03/012868.

Claim 13 ultimately depends from claim 6, and thus is allowable for at least the same reasons.

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CONCLUSION

In view of the above, Applicant respectfully submits that all of the pending claims are in form for allowance. Therefore, reconsideration and withdrawal of the rejections and allowance of the claims are respectfully requested.

No fees are required under 37 C.F.R. 1.16(b)(c). However, if such fees are required, the Patent Office is hereby authorized to charge Deposit Account No. 50-0471.

The Examiner is invited to contact the Applicant's representative at the below-listed telephone numbers to facilitate prosecution of this application.

Any inquiry regarding this Amendment and Response should be directed to Mark Gleason at Telephone No. (612) 767-2503, Facsimile No. (612) 573-2005. In addition, all correspondence should continue to be directed to the following address:

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Respectfully submitted,

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